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Technology Center 2100

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PATENT
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	Rogers; Coburn; Kling; and Craig.	RECEIVED JUN 12 2003 Technology Center 2100
SERIAL NO.:	09/120,594	
EXAMINER:		
FILED:	July 22, 1998	
FOR:	"Computerized Automotive Service Equipment Using Multi-Point Serial Link Data Transmission Protocols"	

Commissioner of Patents and Trademarks
Washington, DC 20231

April 25, 2000
St. Louis, Missouri

PROTEST UNDER 37 CFR 1.291(a)
(Copy Served To Applicant's Last-Known Attorney)

Sir:

The following information is submitted as relevant to the examination of the above-identified U.S. Patent Application. Protestor respectfully points out that, from an analysis of the claims in a published foreign patent document claiming priority from U.S. Application No. 09/120,594, that no inventive concepts are disclosed in this U.S. patent application. Rather, this application simply applies recommended computer hardware development technologies, such as the Universal Serial Bus to well-known concepts shown in prior art products such as Hunter Engineering Company's C111 and D111 wheel aligners. These hardware technologies were well-known over a year prior to the priority date of the 09/120,594 patent application and were in public use or on sale, hence their application to automotive service equipment is neither novel nor inventive.

RELEVANT INFORMATION:

1. Hunter Engineering Co. Form No. 1824T, "Preliminary Hunter System C111 Service Manual", printed September, 1984.
2. Hunter Engineering Co. Form No. 900T-4A, "Hunter System C111", printed February, 1985.
3. Hunter Engineering Co. Form No. 2015T, "Preliminary Hunter System D11 Instrumentation Cabinet Service Manual", printed October, 1986.
4. Hunter Engineering Co. Form No. 2052T, "Now, System D111 ... like an alignment instructor in your shop.", printed October, 1986.
5. Hunter Engineering Co. Form No. 900T-4B, "System D/F/G111 Computerized Wheel Alignment Systems", printed January, 1991.
6. Hunter Engineering Co. Form No. 3576T, "Series 211 Computerized Wheel Alignment Systems", printed December, 1993.
7. Universal Serial Bus Specification, Revision 1.1, September 23, 1998, available online from <http://www.usb.org/developers/docs.html>.
8. Publication: "A Technical Introduction to USB 2.0" available online from <http://www.usb.org/developers/usb20/index.html>.
9. Website presentation and background information: USB.org-Developers-2.0, available online at <http://www.usb.org/developers/usb20/backgrounder.html>.
10. WO Patent No. 00/05104 for "Computerized Automotive Service Equipment Using Multi-Point Serial Link Data Transmission Protocols" to *Rogers et al.*, published February 3, 2000.

REASONS FOR RELEVANCE:

- 1 & 2. Hunter Engineering Company's System C111 computerized wheel alignment system comprised a vehicle diagnostic system (for wheel alignment) containing a computer (Intel 8031 microprocessor) and at least one vehicle diagnostic sensor (wheel angle transducer) operably coupled to the computer through a multi-point serial link. As

shown in Hunter Engineering Co. Form No. 900T-4A, published in February of 1986, the System C111 vehicle wheel aligner was commercially available more than one year prior to the filing of U.S. Patent Application No. 09/120,594. The Hunter System C111 wheel aligner utilized multi-point serial communications between the console, sensor, and remote units.

“The console sends commands to the sensor and remote units over the same two wires. All devices connected to these two wires will hear the command. The command will contain an ID number. This is what determines which individual device the console is talking to. When a command is received the sensor will compare the ID number contained in the command to that of the ID switch position on the transducer control board. If they are the same the sensor will execute the command. If they are different the sensor will ignore the command.”

Hunter Engineering Company Form No. 1824T, page 23. Similarly, the circuit diagrams contained in the System C111 Service Manual further illustrate the hardware facilitating the use of the serial link to connect multiple wheel alignment sensors to the wheel alignment console. See, pg. 24, Fig. 8g, Serial Transmit Driver Z2 and Serial Receiver Z3; pg. 32, Fig. 9c, CPU Block Diagram; pg. 38, Fig. 11, System Wiring Diagram; and the C111 CPU Schematic (Sheet 1 of 2), illustrating common serial link at J1 and J2 for all data sensors.

3, 4, & 5. Hunter Engineering Company's evolution of wheel aligner products continued to utilize multi-point serial links for connecting the wheel angle sensors to a computerized console through the Series D111, F111, and G111 line of products, as is seen in the above-identified product service manuals and product sales literature from the late 1980's. Specifically, page 31 of Hunter Engineering Company Form No. 2015T

illustrates the system wiring diagram for a Series D111 wheel aligner, and together with Figure 14, the card cage functional block diagram, shows the use of serial transmit and receive drivers to connect the sensor and remote indicator communication links.

6. Automotive service equipment utilizing a general purpose computer in place of a custom configured or dedicated micro-processor is illustrated by the Series 211 Computerized Wheel Alignment System, manufactured by Hunter Engineering Company. As seen in Hunter Engineering product brochure No. 3576T, from December of 1993, the Series 211 wheel alignment system utilized an IBM-compatible PC, running the Microsoft Windows multi-tasking operating system. The wheel alignment software installed on the general purpose computer illustrates the magnitude and direction required adjustments to the vehicle wheel alignment. In addition to vehicle wheel alignment software, other automotive vehicle diagnostic software such as Hunter's ExpertAlign Undercar Diagnostic Software or the Mitchell-On-Demand Information System could be installed on the Series 211 general purpose computer. The Series 211 wheel alignment system is an evolution of the earlier Hunter C111, D111, and other letter-series wheel aligners, and accordingly, includes the same multi-point serial link to communicate between the data sensors mounted on the vehicle wheel and the console.

7. The use of the Universal Serial Bus (USB) standard to replace traditional serial and parallel connections between computers and peripheral components is well known. The USB standard was initially published in the early 1990's, and the latest implemented

revision, 1.1, was published in September of 1998, without major modifications¹ from revision 1.0, published in 1996. While revision 1.0 of the USB specification is incorporated by reference in U.S. patent application No. 09/120,594, it clearly contains pertinent teachings which should be further emphasized. Chapter 1 of revision 1.1 of the USB standard describes that the motivation for developing the USB standard stemmed from a need for ease-of-use, i.e. a plug-and-play bus architecture which allows computers to be easily reconfigured without the complications of traditional serial/parallel ports, and from the need for port expansion to interconnect many new devices without constraining the computer architecture through one or two communication ports configured for specific devices. (USB Revision 1.1, page 1). USB was, and is, intended as an industry-wide standard enabling devices from different vendors to operate in an open architecture as an enhancement to PC-architecture, allowing room for product versatility without the burden of carrying obsolete interfaces or losing compatibility. Accordingly, the USB specification teaches that the multi-point serial link defined therein is designed specifically to achieve the goals of set forth in U.S. patent application No. 09/120,594 for a wide range of computer applications.

The USB specification further teaches the use of four different types of data flow. (See, pg. 20). These include control transfers, bulk data transfers, *interrupt data transfers*, and *isochronous data transfers*. USB devices may be interconnected in a wide range of topologies, as is shown in Fig. 4-1 at page 16 of the USB specification. In such topologies, attachment points are referred to as ports, with hubs converting single

¹ Revision History on page ii of Revision 1.1 of the USB Specification states that Revision 1.1 contains updates to

attachment points into multiple attachment points. The USB architecture supports concatenation of multiple hubs (see, section 4.8.2.1, page 22) and the addition and removal of devices as needed.

8 & 9. The Universal Serial Bus standard was first set forth in the early 1990's. Currently, the next generation of USB standards, known as USB 2.0 is being developed. Information describing this new standard is readily available on the internet at the www.usb.org/developers/usb20 website, and is further set forth in these two references. Specifically, USB 2.0 is a backwards compatible extension of USB 1.1, using the same cables and software, but with much higher bandwidth to accommodate higher performance peripherals such as cameras, scanners, printers and high-speed storage devices. Accordingly, USB 2.0 is the next evolutionary step in multi-point serial links for computer peripherals.

10. The following chart identifies the relationship between each of the above-cited references and the claims found in published WO Patent No. 00/05104, which claims priority from U.S. Patent Application No. 09/120,594. It is believed that the subject matter of the claims published in WO Patent No. 00/05104 is substantially similar to that of the claims pending in U.S. Patent Application No. 09/120,594.

REFERENCE NO.	RELEVANT TO THE SUBJECT MATTER SET FORTH IN WO 00/05104 CLAIMS:
1, 2	1, 4, 9-13, 17-23, 27.
3, 4, 5	1, 4, 9-13, 17-23, 27.
6	1, 5, 11-14, 17, 20, 21.
7	1-3, 5-7, 14-15, 17, 19, 20-24, 27
8, 9	1-3, 5-7, 14-15, 17, 19, 20-24, 27

fix identified problems from Revision 1.0.

In summary, the allegedly patentable features disclosed and claimed in United States Patent Application No. 09/120,594 to *Rogers et al.*, filed on July 22, 1998, are believed to be fully disclosed by prior art references and products such as Hunter Engineering Company's C111 and D111 series of vehicle wheel aligners, or are obvious in view of such prior art products and the requirements and features of software and hardware compatible with then-current computer operating systems and architectures, as is illustrated in the above-referenced documents. Clearly, the mere inclusion of a standardized multi-point serial link, such as a Universal Serial Bus in an automotive diagnostic device does not produce a patentable invention, particularly in view of standard and well-known computer hardware standards which specifically teach and suggest the use of such features and characteristics to connect peripheral components to computerized systems to replace older less efficient and lower bandwidth connections such as single-point serial connections, parallel connections, custom interface cards, and custom or proprietary multi-point serial links. For the same reason, application of current evolutionary computer products, such as USB 2.0 which are designed to provide even higher bandwidth computer peripheral connections, to automotive service devices would not be inventive. Rather, such an application is merely a utilization of the latest computer product to an old and well-known field.

Respectfully submitted,



Mark E. Books, Reg. No. 40,918
Polster, Lieder, Woodruff & Lucchesi, L.C.
763 South New Ballas Road, Suite 230
St. Louis, MO 63141
(314) 872-8118

I hereby certify that this correspondence and all attachments is being deposited with the U.S. Postal Service on April 25, 2000 as first class mail in an envelope addressed to:

Assistant Commissioner for Patents
Washington, DC 20231,

and that in compliance with 37 CFR 1.291(a)(2) and 37 CFR 1.248(a)(4), a second copy of this correspondence and all attachments is being deposited with the U.S. Postal Service on April 25, 2000 as first class mail in an envelope addressed to:

Mr. Stephen A. Becker, et al.
McDermott, Will & Emery
600 13th Street, N.W.
Washington, DC 20005-3096

listed as Agent of Record for WO International Application No. 00/05104, claiming priority from U.S. Patent Application No. 09/120,594.

Mark E. Books
Mark E. Books, Reg. No. 40,918
4/25/00
Date of Signature